

NAE Grand Challenge Scholars Program

The National Academy of Engineering Grand Challenge Scholars Program is a combined curricular and extra-curricular program with five components that are designed to prepare students to be the generation that solves the grand challenges facing society in this century.

The program is based on the Grand Challenges for Engineering in the 21st Century the NAE identified in 2008. These are 14 global problems that must be addressed to ensure a sustainable future.



Declaration of Principles

Nearly all the NAE Grand Challenges address complex social issues that require innovative technology and a systems approach to solve but cannot be solved in a vacuum. They will also require engineers to shape public policy, transfer technical innovation to the market place, and to inform and be informed by social science and the humanities. These are challenges to “change the world,” and many of them are inherently global. Students of this generation have the “right stuff” to address them. Judging by the survey results of the recent NRC report *Engineer of 2020*, this generation of students is motivated by a desire to change the world.

Preparing the next generation of engineers

The five components of the Grand Challenge Scholars Program include:

1. **Research experience.** Project or independent research related to a Grand Challenge.
2. **Interdisciplinary curriculum we call Engineering+.** Preparing engineering students to work at the overlap with public policy, business, law, ethics, human behavior, risk as well as medicine and the sciences. Examples that span these disciplines with a coherent theme are Energy and the Environment, Sustainability, Uncertainty and Optimization, etc.
3. **Entrepreneurship.** Preparing students to translate invention to innovation; to develop market ventures that scale to global solutions in the public interest.
4. **Global dimension.** Developing the students’ global perspective necessary to address challenges that are inherently global as well as to lead innovation in a global economy.
5. **Service learning.** Developing and deepening students’ social consciousness and their motivation to bring their technical expertise to bear on societal problems. Programs such as Engineers Without Borders, or Engineering World Health may be adapted to satisfy this component and/or component 3.

It is hoped that by fall 2010, there will be a critical mass of schools offering the Grand Challenge Scholars Program to undergraduates. Toward that end, Olin College is hosting a “Grand Challenge Scholars Workshop” April 22 for institutions that have committed to implementing the program on their campuses. There are now 6 approved programs, and the first crop of Grand Challenge Scholars will graduate this spring.